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10/518,931	02/16/2005	Markus Berger	202-053	1285

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EXAMINER	
KOCH, GEORGE R	
ART UNIT	**PAPER NUMBER**
1734	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,931	BERGER ET AL.	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 32-62 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 32-62 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 12/22/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 32-46 and 51-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumgarten (US 4,118,162; see also applicant's description of this reference in the specification, pages 2-3, as amended in the specification amendment filed 12/22/2004), Reynolds (US 6,620,475 B1) and Lietz (U 6,508,972)

As to claim 32, Baumgarten discloses a method for making reinforced tube-shaped structures comprising the steps of:

a) applying a first rubber layer with a first extrusion unit (see Figure 1, items 5-6, column 4, lines 12-17; see also applicant's specification, page 2, line 27) to a series of sequential rigid cylindrical mandrels (see Figure 1, items 3) which are coupled to each other and which are

driven at an advancement speed (the machine speed in Figure 1 is the advancement speed) in the direction of an advancement axis (the direction of travel in Figure 1 is the axis);

b) applying a first filament layer (via thread reinforcing machine 7) at defined desired filament angles (the angle which the thread unit applies threads has a desired angle) referred to the advancement axis (X)

c) applying at least one further rubber layer to the first filament layer utilizing at least one additional extrusion unit (extrusions unit 8 and 9);

Baumgarter does not disclose rotating a bobbin creel unit about the advancing mandrels; continuously measuring the advancement speed of the mandrels; controlling the rubber quantity, which is applied via the first extrusion unit, in dependence upon the measured advancement speed in order to obtain a defined desired thickness of the first rubber layer; or controlling the rotational speed of the first bobbin creel unit during the rotation about the mandrels in dependence upon the advancement speed in order to obtain a filament layer having the defined desired filament angles.

Lietz discloses continuously measuring the advancement speed of the mandrels in a rubber tube manufacturing process (see Lietz, item 66, tube speed sensor) and then e) controlling the rubber quantity, which is applied via the first extrusion unit, in dependence upon the advancement speed in order to obtain a defined desired thickness of the first rubber layer;(see column 3, lines 17-47). Lietz also discloses controlling both the speed routines and extrusion routines through the same controller (see column 5, lines 47-54). Lietz recognizes that the thickness can be controlled either by adjusting the extrusion rate or the conveyance rate, and this ensures proper thickness of the tubes. Therefore, it would have been obvious to one of ordinary

skill in the art at the time of the invention to have measured the advancement speed in connection with a step for controlling the extrusion rate or speed in order to ensure proper tube thickness.

Additionally, Reynolds discloses continuously measuring the advancement speed of the mandrels in a rubber/composite tube manufacturing process (see Reynolds, item 30, and column 5, lines 12-45; rotating a bobbin creel unit (bobbins 24, see columns 3 through 5 in general) about the advancing mandrels; f) controlling the rotational speed of the first bobbin creel unit during the rotation about the mandrels in dependence upon the advancement speed in order to obtain a filament layer having the defined desired filament angles (explicitly in column 5, lines 12-45). Reynolds discloses that measuring the axial speed and controlling the rotational speed of the bobbin station allows for accurate control of the angle of the fibers (see column 5, lines 38-45, disclosing an accuracy of ½ a degree). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have measured the advancement speed in connection with a step of rotating and controlling the rotation speed of a bobbin creel unit in order to achieve accuracy in the angle of the fibers.

As to claim 33 Lietz as incorporated above discloses the further step of continuously measuring the thickness of the first rubber layer and controlling the rubber quantity, which is applied via the first extrusion unit, in dependence upon the measured thickness (via thickness sensor 30).

As to claim 34, Reynolds as incorporated discloses the further step of controlling the rotational speed of the bobbin creel unit, and as modified by Lietz, would also include an dependence upon the measured thickness of the first rubber layer.

As to claim 35, Lietz as incorporated above discloses the further step of controlling the rubber quantities (see column 3), which are applied via the further extrusion unit in dependence upon the advancement speed in order to obtain a defined desired thickness of the additional rubber layers.

As to claim 36, Reynolds as incorporated discloses the further step of controlling the mandrel advancement speed in accordance with the measured advancement speed (see column 4, lines 41-64).

As to claim 37, both Lietz and Reynolds as incorporated in Baumgarten discloses the further steps of: applying at least one further filament layer (see column 6, lines 54 through column 7, which discusses multiple winding stations) to each of the first rubber layers at defined desired filament angles (column 7 discusses different angles) referred to the advancement axis in each case with a second bobbin creel unit by rotating the second bobbin creel about the forwardly driven mandrels (the winding station would the be the same as the first winding station - column 2, lines 46-61 contemplates multiple stations); applying at least one additional rubber layer to each filament layer utilizing a corresponding extrusion unit (Baumgarten uses one more extruding unit than winding units - see Figure 1); controlling the rotational speed of the additional bobbin creel unit during the rotation about the mandrels in dependence upon at least one of the advancement speed and the rotational speed of the first bobbin creel unit (see the description of the first winding unit as applied to claim 32 above); and, controlling the rotational

speeds of the additional bobbin creel unit in dependence upon a desired thickness of the additional rubber layer and the desired filament angles with the bobbin creel units being coupled to each other via a dead time and coupling factors (see Lietz as applied above).

As to claim 38, Reynolds as incorporated in Baumgarten discloses the further step of variably adjusting the filament angles (see column 3 through 5 and the citations above) by controlling the rotational speeds of the bobbin creel units with the bobbin creel units being coupled to each other via a dead time and coupling factors so that a change of the filament angle of a filament layer is coupled by a bobbin creel unit to a position of the reinforced tube-shaped structure to a corresponding change of the filament angle of additional filament layer at the same position via the additional bobbin creel unit.

As to claim 38, Lietz as incorporated in Baumgarten discloses the further step of controlling the rubber quantities, which are applied via the extrusion units, in dependence upon the measured mean wall thickness (see thickness sensor 30). Furthermore, duplication of parts is obvious. MPEP 2144.04 VI. B. Therefore, it would have been obvious to one of ordinary skill in the art to have also duplicated the extrusion control elements of Lietz for each of the extruders of Baumgarten in order to ensure that each layer has the appropriate thickness.

As to claim 40, Lietz as incorporated in Baumgarten discloses the further step of controlling the rubber quantity, which is applied by an extrusion unit, in dependence upon the particular pressure in the injection head of the corresponding extrusion unit is well known and conventional (see column 3, lines 27-29, which discloses that the gear pump rate may be adjusted)

As to claim 41, Lietz as incorporated in Baumgarten discloses the further step of controlling the thicknesses of the applied rubber layers via rotational speed control of a gear pump (column 3, lines 27-29 discuss controlling a gear pump), which is mounted, in each case, between the extruder and the extrusion head of an extrusion unit.

As to claim 42, Lietz as incorporated in Baumgarten discloses the further step of measuring the thickness (d) of the applied layers at several positions on the periphery of the reinforced tube-shaped structure for control, fault detection and/or fault characterization when there is a deviation from a desired value with the deviation going beyond a defined tolerance limit. Lietz teaches an array of charge coupled devices can be used (see column 3). This array is a measurement as several positions on the periphery.

As to claim 43, official notice is taken that the step of determining the layer thickness from the mean value of the thicknesses of the applied layers with the thicknesses being measured at the periphery is well known and conventional. Such mean or averaged values are well known in the control art as a mechanism for filtering out outlier and error measurements. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilizing a mean or averaging technique in order to filter out outlier and error measurements.

As to claim 44, official notice is taken that the step of rotating a unit to measure the thicknesses of the applied layers over the time about the periphery of the reinforced tube-shaped structure and recording the thickness at several peripheral positions is well known and conventional. One in the art would appreciate that multiple moving measurements would also function as a mechanism to filter out error signals. Therefore, it would have been obvious to one

of ordinary skill in the art at the time of the invention to have utilizing a rotating unit technique in order to filter out outlier and error measurements.

As to claim 45, Lietz as incorporated in Baumgarten discloses the further step of contactlessly (see column 3, line 34, which recites "contactlessly") measuring the outer edges of the reinforced tube-shaped structure and the outer edges of the mandrel and determining the thickness of the reinforced tube-shaped structure from the positions of the outer edges (see column 3, lines 42-46, which suggests capacitive sensors which have this capability).

As to claim 46, Lietz as incorporated in Baumgarten discloses the further step of optically measuring the outer edges of the reinforced tube-shaped structure (via the linear photosensor) and inductively measuring the outer edges of the mandrel (via the capacitive sensor).

As to claim 51, Baumgarten discloses an arrangement for making reinforced tube-shaped structures comprising: a) a first extrusion unit (items 5 and 6) for applying a first rubber layer to a series of sequential rigid cylinder-shaped mandrels, which are coupled to each other, the mandrels being driven at an advancement speed (the speed the mandrels move in figure 1 is the advancement speed) in a direction of an advancement axis (the direction the mandrels move in figure 1 is the advancement axis); b) a first bobbin creel unit, (winding unit 7) , for applying a first filament layer at defined desired filament angles referred to the advancement axis; c) at least one additional extrusion unit (extrusion unit 8 and 9) for applying at least one additional rubber layer to the first filament layer.

Baumgarter does not disclose rotating a bobbin creel unit about the advancing mandrels; advancement speed measuring means for continuously measuring the advancing speed of the

mandrels; at least one control unit for driving the extrusion units and the bobbin creel units with the control unit being configured for: controlling the rotational speed of the first bobbin creel unit during the rotation about the mandrels in dependence upon the advancement speed in order to obtain a filament layer having defined desired filament angles; and, controlling the rubber quantity, which is applied by the first extrusion unit in dependence upon the measured advancement speed in order to obtain a defined desired thickness of the first rubber layer.

Lietz discloses advancement speed measuring means for continuously measuring the advancing speed of the mandrels (see Lietz, item 66, tube speed sensor) and then e) controlling the rubber quantity, which is applied via the first extrusion unit, in dependence upon the advancement speed in order to obtain a defined desired thickness of the first rubber layer;(see column 3, lines 17-47). Lietz also discloses controller or control unit for controlling the rubber quantity, which is applied by the first extrusion unit in dependence upon the measured advancement speed in order to obtain a defined desired thickness of the first rubber layer (see column 5, lines 47-54). Lietz recognizes that the thickness can be controlled either by adjusting the extrusion rate or the conveyance rate, and this ensures proper thickness of the tubes. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to measure the advancement speed in connection with a step for controlling the extrusion rate or speed in order to ensure proper tube thickness.

Additionally, Reynolds discloses advancement speed measuring means for continuously measuring the advancing speed of the mandrels in a rubber/composite tube manufacturing process (see Reynolds, item 30, and column 5, lines 12-45; rotating a bobbin creel unit (bobbins 24, see columns 3 through 5 in general) about the advancing mandrels; a control unit configured

for controlling the rotational speed of the first bobbin creel unit during the rotation about the mandrels in dependence upon the advancement speed in order to obtain a filament layer having defined desired filament angles (see column 5, lines 12-45). Reynolds discloses that measuring the axial speed and controlling the rotational speed of the bobbin station allows for accurate control of the angle of the fibers (see column 5, lines 38-45, disclosing an accuracy of ½ a degree). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have measured the advancement speed in connection with a step of rotating and controlling the rotation speed of a bobbin creel unit in order to achieve accuracy in the angle of the fibers.

As to claim 52, Lietz discloses layer thickness measuring means for continuously measuring the thickness (see item 30) of the first rubber layer and controlling the rubber quantity, which is applied by the first extrusion unit, in dependence upon the measured mean thickness (see claim 33 above)

As to claim 53, Lietz makes obvious an additional layer thickness measuring means behind the additional extrusion units to continuously measure the thickness of the particular rubber layer and controlling the rubber quantity in dependence upon the correspondingly measured mean thickness (d), the rubber quantity being applied via the corresponding extrusion unit. MPEP 2144.04 VI B makes duplication of parts obvious. Therefore, it would have been obvious to take the single extruderthickness controlling mechanism of Lietz and duplicate it for each extruder of Baumgarten.

As to claim 54, Lietz discloses that the control unit is also configured for controlling the rubber quantities in dependence upon the advancement speed (v) in order to obtain a defined

desired thickness of the additional rubber layers with the rubber quantities being applied via the additional extrusion unit (see column 3).

As to claim 55, Reynolds as incorporated discloses the control unit is configured for controlling the mandrel advancement speed in accordance with the measured advancement speed (see column 4, lines 41-64).

As to claim 56, Reynolds as incorporated discloses at least one additional bobbin creel unit for applying an additional filament layer to the particular rubber layer at a defined desired filament angle (see column 6, lines 54 through column 7, which discusses multiple winding stations) referred to the advancement axis; and, at least one additional extrusion unit for applying additional rubber layers to respective filament layers (Baumgarten discloses at least one additional extrusion unit than winding units).

As to claim 57, Reynolds as incorporated discloses at least one additional control unit which is configured to: control the rotational speed of the additional bobbin creel units (see column 2, lines 46-60, which recite that the system can include any number of disclosed winding stations) in dependence upon a desired thickness of the respective rubber layers and the respective desired filament angles (see rejection of claim 52 above); control the additional bobbin creel units during rotation about the mandrels in dependence upon the advancement speed (via a duplicated sensor 30 for each winding unit, as contemplated by the multiple winding units embodiment). Furthermore, Lietz as incorporated makes obvious the capability to control the additional rubber quantity, which is applied by the additional extrusion units, in dependence upon the measured advancement speed of the mandrels (see columns 3 and 5; see also Baumgarten which discloses multiple extruders).

As to claim 58, Leitz as incorporated discloses a gear pump (see column 3, lines 27-29) between each extruder and the extrusion head of each extrusion unit for controlling the thickness of the applied rubber layers with the control taking place via a rotation speed change of the gear pump.

As to claim 59, Leitz as incorporated discloses the layer thickness measuring means has measuring units for measuring the outer edges of the reinforced tube-shaped structure at several positions on the periphery of the tube-shaped structure (via the light sensors; see column 3) and at least one contactless measuring sensor for detecting the outer edges of the mandrel (via the capacitive sensors; see column 3).

As to claim 60, official notice is taken that the layer thickness measuring means for recording the outer edges at several positions on the periphery of the reinforced tube-shaped structure are rotatable about the reinforced tube-shaped structure is well known and conventional. One in the art would appreciate that multiple moving measurements would also function as a mechanism to filter out error signals. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilizing a rotating unit technique in order to filter out outlier and error measurements.

As to claim 61, Leitz as incorporated discloses computing means (see column 5, lines 47-54, see also master controller 79), which are connected to the layer thickness measuring means (item 30 and are configured for determining the thickness of the reinforced tube-shaped structure from the mean value of the specific thicknesses at several peripheral positions of the reinforced tube-shaped structure (see column 3, lines 34-47, which discloses an array of charged coupled devices as part of the sensor).

As to claim 62, Leitz as incorporated makes obvious at least one measuring sensor for the outer edges of the mandrel is an inductive sensor (Lietz discloses a capacitive sensor, and an inductive sensor is considered an obvious variation of a capacitive sensor).

4. Claims 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumgarten, Lietz and Reynolds as applied to claim32-46 above, and further in view of Deregibus (US 4,753,699).

As to claim 47, none of the references applied in claims 32-46 above suggest applying an separating agent.

However, Deregibus discloses that the further step of applying a separating agent to the mandrels is known as a non-preferred embodiment (see column 4, lines 50-53, disclosing the use of a silicon emulsion). One in the art would appreciate that such an application as disclosed would be done either a separating agent application unit in advance of applying the first rubber layer, or by manual application, and it is considered obvious to automate a manual activity (MPEP 2144.04 III), and vice versa. Furthermore, it is considered obvious to control the applied separating agent quantity in dependence upon the advancement speed of the mandrels, since the amount of separating agent needs to be sufficient to separate the composite from the mandrel. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such separating agents and to apply them automatically in consideration of the speed.

As to claim 48, official notice is taken that the further step of applying separating agents to the outermost rubber layer and controlling the applied quantity of separating agent in

dependence upon the advancement speed (v) of the mandrels is well known and conventional, in order to ensure appropriate amount of separating agent. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the claimed step in order to ensure appropriate amount of separating agent.

As to claim 49, official notice is taken that further step of measuring process variables during the application of the rubber layers and the reinforcement layers; marking defective regions of the reinforced tube-shaped structure when the process variables exceed or drop below a corresponding fault tolerance amount; optically detecting the marked defective regions; and, separating out the sections of the reinforced tube-shaped structure which are recognized as defective is well known and conventional. One in the art would appreciate that such marking steps ensure identification of defective areas in the composite manufacturing process. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such marking steps in order to ensure identification of defective locations.

As to claim 50, official notice is taken that the further step of marking sections of the reinforced tube-shaped structure after the application of the topmost rubber layer with a product marking, especially with the production time and/or a charge number wherein the marking identifies a separation location and the assembly facility and direction of assembly of the structure is well known and conventional. One in the art would appreciate that such marking steps ensure identification of defective areas in the composite manufacturing process. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such marking steps in order to ensure identification of defective locations. Furthermore, the step of "especially with the production time and/or a charge number wherein the marking

identifies a separation location and the assembly facility and direction of assembly of the structure" is considered an optional limitation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

George R. Koch III
Primary Examiner
Art Unit 1734

GRK
9/19/2007